



## THE HONG KONG COLLEGE OF ANAESTHESIOLOGISTS

### FINAL FELLOWSHIP EXAMINATION (INTENSIVE CARE) SHORT ANSWER PAPER

15 Questions

Monday 21 July 2025 (9:30 am - 12:00 nn)

#### NOTICE

- (A) Write your answers to the 15 questions in separate books.
- (B) It is not necessary to rewrite the question in your answer book.
- (C) You should answer each question in ten minutes or less.
- (D) The questions are worth equal marks.
- (E) Record your number on the cover of each book and hand in all books.
- (F) Use ink or ball-point pen

#### Question 1

Regarding hyperglycemic diabetic ketoacidosis and hyperosmolar hyperglycaemic state, compare and contrast the following.

- a. Diagnostic features (3 marks)

Management principles of

- b. Fluid therapy (2 marks)
- c. Insulin therapy (3 marks)
- d. Goals of therapy (2 marks)

#### Question 2

A middle-aged lady was admitted to the surgical ward for shortness of breath. She was noted to have stridor with a huge goitre.

- a. ICU team was consulted for airway support. Outline the key considerations when you manage the patient now. (5 marks)

The patient was intubated, stabilized with thyroidectomy done subsequently. She was extubated and transferred to ICU postoperatively for monitoring.

- b. Few hours postoperatively in ICU, she developed stridor. List four specific causes for the stridor. (2 marks)
- c. On further examination, she was noted to have progressive neck swelling with stridor. Describe your management. (3 marks)

#### Question 3

A 35-year-old female with a history of asthma presented with exacerbation of asthma. She had shortness of breath and productive cough for 2 days. She was intubated and transferred to ICU. She was given inhaled salbutamol, ipratropium, intravenous hydrocortisone and antibiotics. The patient becomes hypotensive on arrival to ICU.

- a. List 4 differential diagnosis for her hypotension. (2 marks)
- b. Outline your initial ventilatory strategy. (4 marks)

Bronchospasm persists despite the above treatment.

- c. List 4 additional pharmacological agents that could potentially improve this patient's bronchospasm and explain the mechanism of action of each. (4 marks)

#### **Question 4**

A 32-year-old G2P1 woman at 35 weeks of gestation presents to the emergency department with low grade fever, mild confusion, headache and nausea. On examination, she has jaundice, oedema, her blood pressure is 170/110 mmHg, and she has proteinuria 3+ on urine dipstick.

- a. List four top differential diagnoses. (2 marks)
- b. Discuss how you would investigate to establish the diagnosis. (8 marks)

#### **Question 5**

Regarding Mg

- a. List the clinical manifestation of hypermagnesemia. (4 marks)
- b. List the causes of hypermagnesemia. (2 marks)
- c. Outline your management strategy for severe hypermagnesemia. (4 marks)

#### **Question 6**

Compare and contrast the humidification of a ventilator circuit using circuit humidification system versus a Heat and Moisture Exchanger in terms of the following:

- a. Mechanism and Efficiency (5 marks)
- b. Risks and Contraindications (5 marks)

#### **Question 7**

A 70-year-old female in the ICU develops severe diarrhoea after prolonged antibiotic use for pneumonia. She is hemodynamically unstable, and colonoscopy showed Pseudomembranous colitis.

- a. What is the cause? (1 mark)
- b. Outline the management plan for this condition. (6 marks)
- c. What are the indications for surgical intervention? (2 marks)
- d. What are the indications of fecal microbiota transplantation? (1 mark)

#### **Question 8**

You are the ICU Consultant for this week. A 70-year-old man was admitted to your ICU for hyperglycaemic hyperosmolar syndrome 5 days ago. He was alert and orientated on ICU admission. Despite correcting his metabolic derangements, he became more confused and is now disorientated to time and place. He became combative today and kicked a nurse. The confusion is attributable to the initial metabolic encephalopathy and there are no other concerning causes identified. Physical restraint and intravenous dexmedetomidine was used to treat his delirium.

His son last saw him on day of ICU admission. He visited him today and demanded that we remove the restraints. He is angry because he thinks the ICU team has made his father agitated. He believes his father wants to be discharged from hospital. He has requested to speak with you today.

- a. What are the key ethical issues in this scenario? (3 marks)
- b. What are the key discussion points with his son? (7 marks)

### **Question 9**

- a. List out the differences between traumatic cardiac arrest (TCA) and non-traumatic out-of-hospital cardiac arrest (OHCA) regarding:
  - i. Causes (2 marks)
  - ii. Treatment priority (2 marks)
  - iii. Role of cardiopulmonary resuscitation (CPR) to obtain return of spontaneous circulation (ROSC) (2 marks)
- b. What are the roles of resuscitative thoracotomy (2 marks) and resuscitative endovascular balloon occlusion of aorta (REBOA) in TCA? (2 marks)

### **Question 10**

List advantages (5 marks) and disadvantages (5 marks) of peritoneal dialysis as a form of renal replacement therapy when compared to continuous renal replacement therapy.

### **Question 11**

For a patient on day 10 in the clinical course of acute pancreatitis:

- a. List the gastrointestinal (GI), hepatobiliary pancreatic (HBP) causes of **fever**. (4 marks)
- b. Outline your diagnostic approach for the causes. (4 marks)
- c. Comment on the role of antibiotics in acute pancreatitis. (2 marks)

### **Question 12**

A 65-year-old male presented with severe substernal chest pain. On examination, he is pale, clammy, and disoriented.

His vital signs are as follows:

Blood pressure 78/48 mmHg while on Dopamine 20ml/hr, heart rate 120 bpm, and SpO<sub>2</sub> 88% on room air. His extremities are cool, with a capillary refill of 4 seconds and urine output of 10 ml over the last hour.

Laboratory result shows lactate 4.5 mmol/L.

An ECG shows ST-elevation in leads V1-V4

The echocardiogram reveals an ejection fraction of 15% with anterior and septal wall akinesis.

Acute myocardial infarction with cardiogenic shock is diagnosed.

- a. Based on the clinical findings, determine this patient's SCAI SHOCK stage and justify your choice. (2 marks)
- b. Describe the initial management priorities for this patient in the ICU. (3 marks)
- c. State the advantages of VA ECMO and Impella CP separately for this patient if the initial supportive management fails. (5 marks)

**Question 13**

A 45-year-old male with a recent diagnosis of acute myeloid leukemia (AML) is transferred to ICU for severe respiratory distress and altered mental status.

His vitals are as follows:

Blood pressure 90/55 mmHg, heart rate 130 bpm, respiratory rate 35 breaths per minute, SpO<sub>2</sub> 80% on room air.

Laboratory results reveal a hemoglobin level of 6 g/dL, platelet count of  $15 \times 10^9/L$ , potassium 5.5 mmol/L and lactate 6.5 mmol/L. Peripheral blood smear shows hyperleukocytosis with a predominance of blast cells.

- a. Apart from leukostasis, what are the possible hematological emergencies this patient is experiencing? (2 marks)
- b. Outline the pathophysiology of leukostasis. (2 marks)
- c. List the initial management steps to be taken in leukostasis. (3 marks)
- d. List the potential complications associated with hyperleukocytosis if not treated promptly. (3 marks)

**Question 14**

Compare and contrast the mannitol and hypertonic saline in terms of:

- a. Mechanism of action and clinical effect (3 marks)
- b. Advantages (3 marks)
- c. Disadvantages (4 marks)

**Question 15**

- a. What are the aims of randomization in a randomized controlled trial? (1 mark)
- b. Discuss the advantages and disadvantages of simple randomization, block randomization and stratified randomization? (6 marks)
- c. What are the differences between composite outcome and surrogate outcome regarding the characteristics, advantages and disadvantages? You may tabulate your answer. (3 marks)

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